CATERPILLAR DIESEL ENGINES

Systems' Operation & Maintenance

July 2002

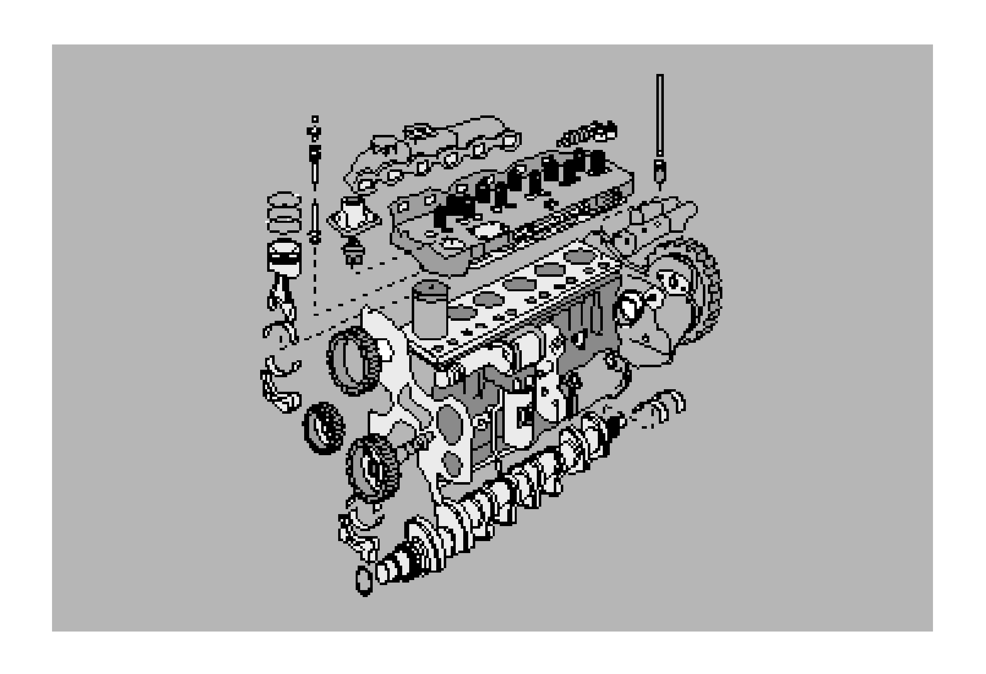
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Course Objectives

- This course introduces the participant to engine systems and maintenance
- After successfully completing this course, the participant will be able to:
  - *Identify diesel engine components and their functions*
  - *Describe engine systems*
  - *Apply safely the engine maintenance*

Engine Components



Engine Components

- Cylinder Block
  - Must exhibit maximum strength
  - Precision cast using a combination of alloys

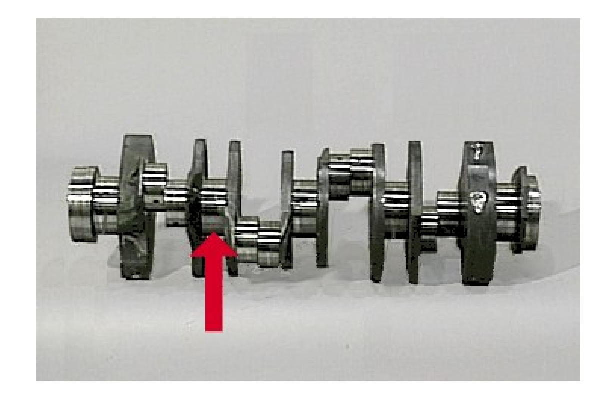
Engine Components

- Cylinder Head
  - Excellent structural strength & rigidity
  - Significant resistance to cracking



Engine Components

- Crankshaft
  - Forged carbon steel
  - Totally hardened
  - Longer wearing & stronger
  - Reduced possibility of cracking



Engine Components

- Connecting Rods
  - Forged boron steel
  - Hardened & shot peened for stress relief
  - Tapered end



Engine Components

- Pistons
  - Aluminum alloy casting
  - Cast-in nickel iron band for compression rings providing excellent compression & oil control & Reducing friction & heat buildup

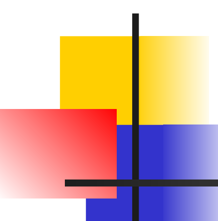
Engine Components

- Piston Rings
  - Made from nodular iron for strength and durability
  - Oil & intermediate rings are chrome coated
  - Top ring plasma coate
  - Excellent wear
  - Scuff-resistant

Engine Components

- Cylinder Liners





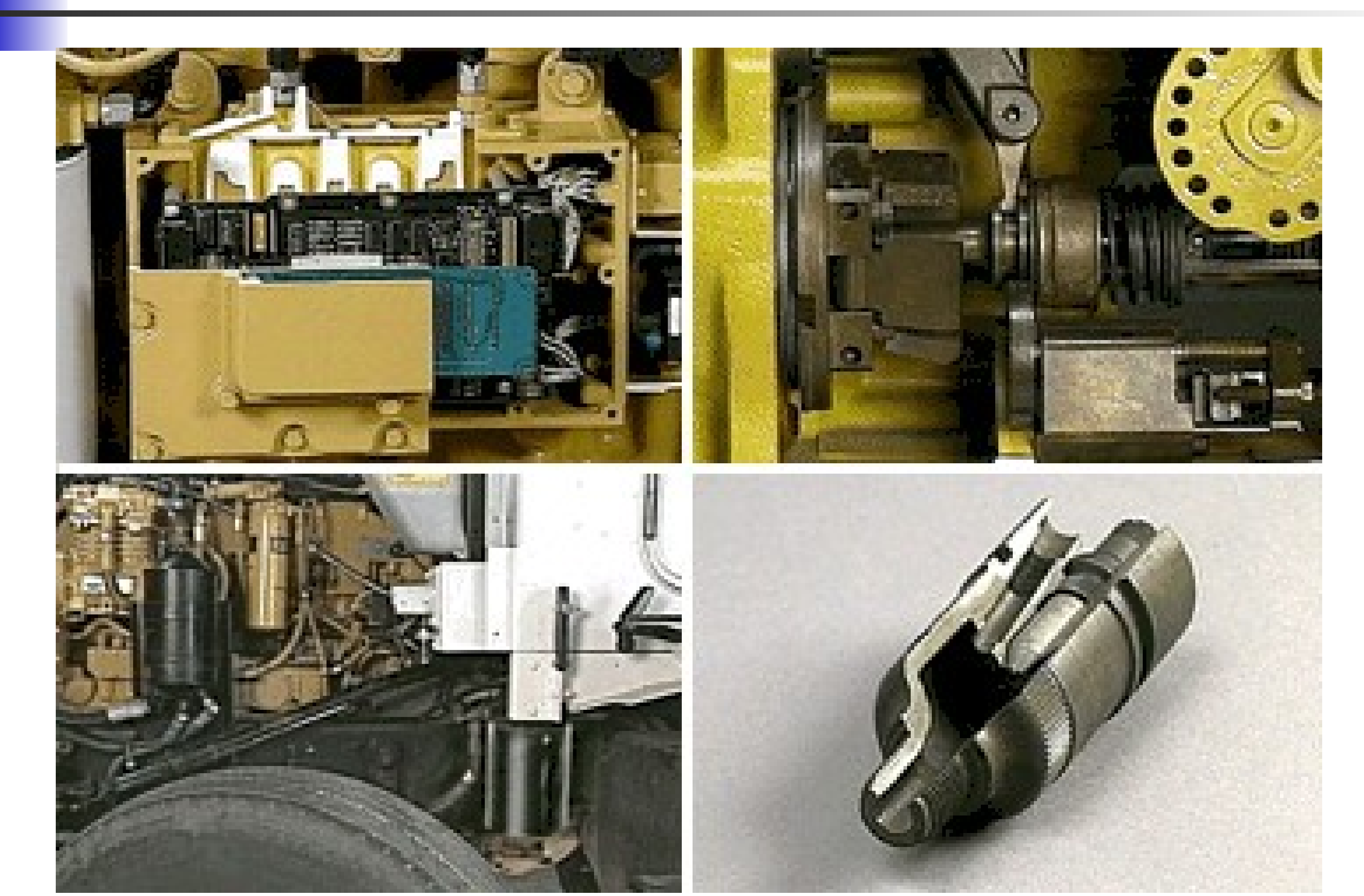
Diesel Engine Systems

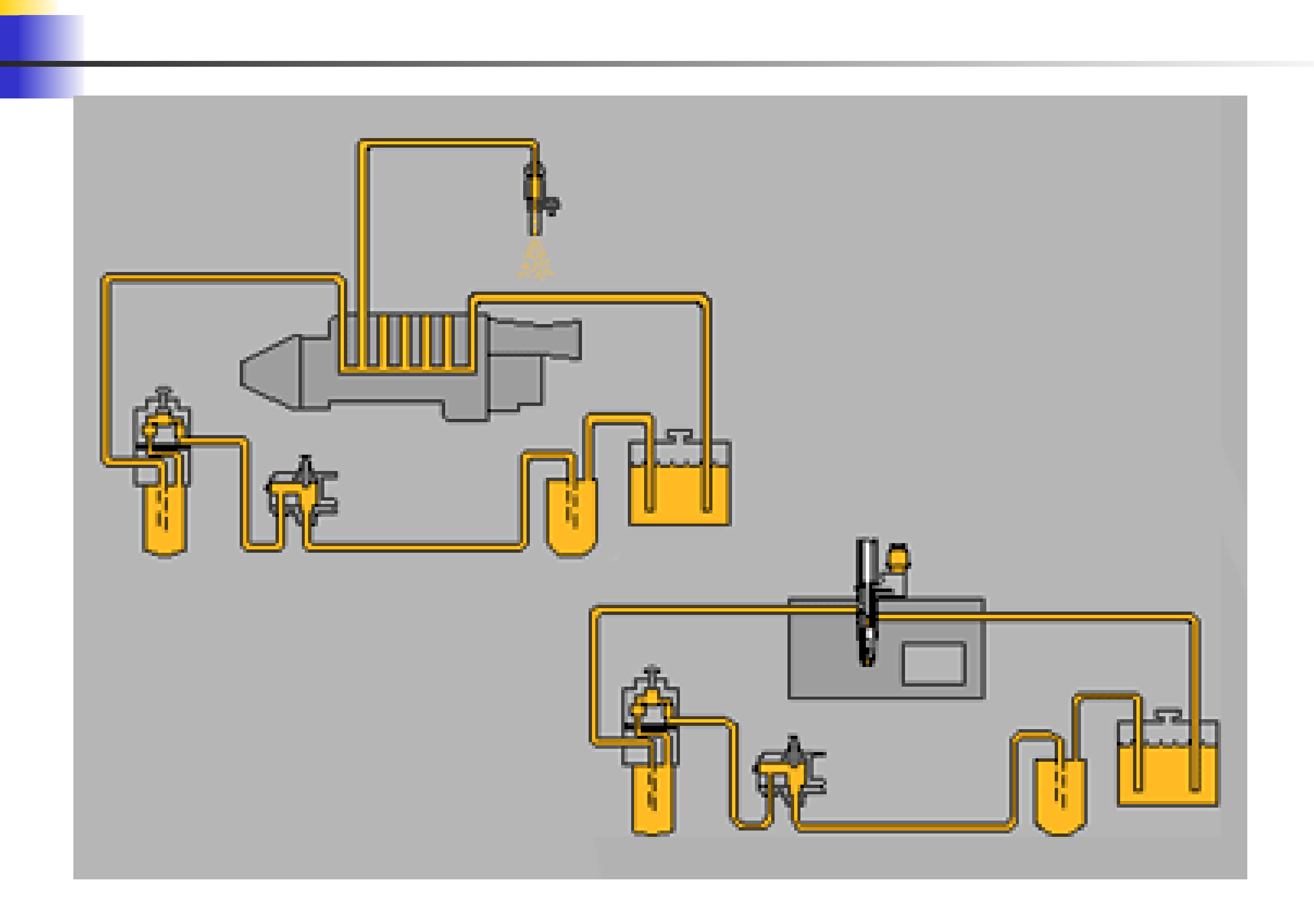
- Fuel System
- Air Intake & Exhaust System
- Lubrication System
- Cooling System
- Starting & Charging System

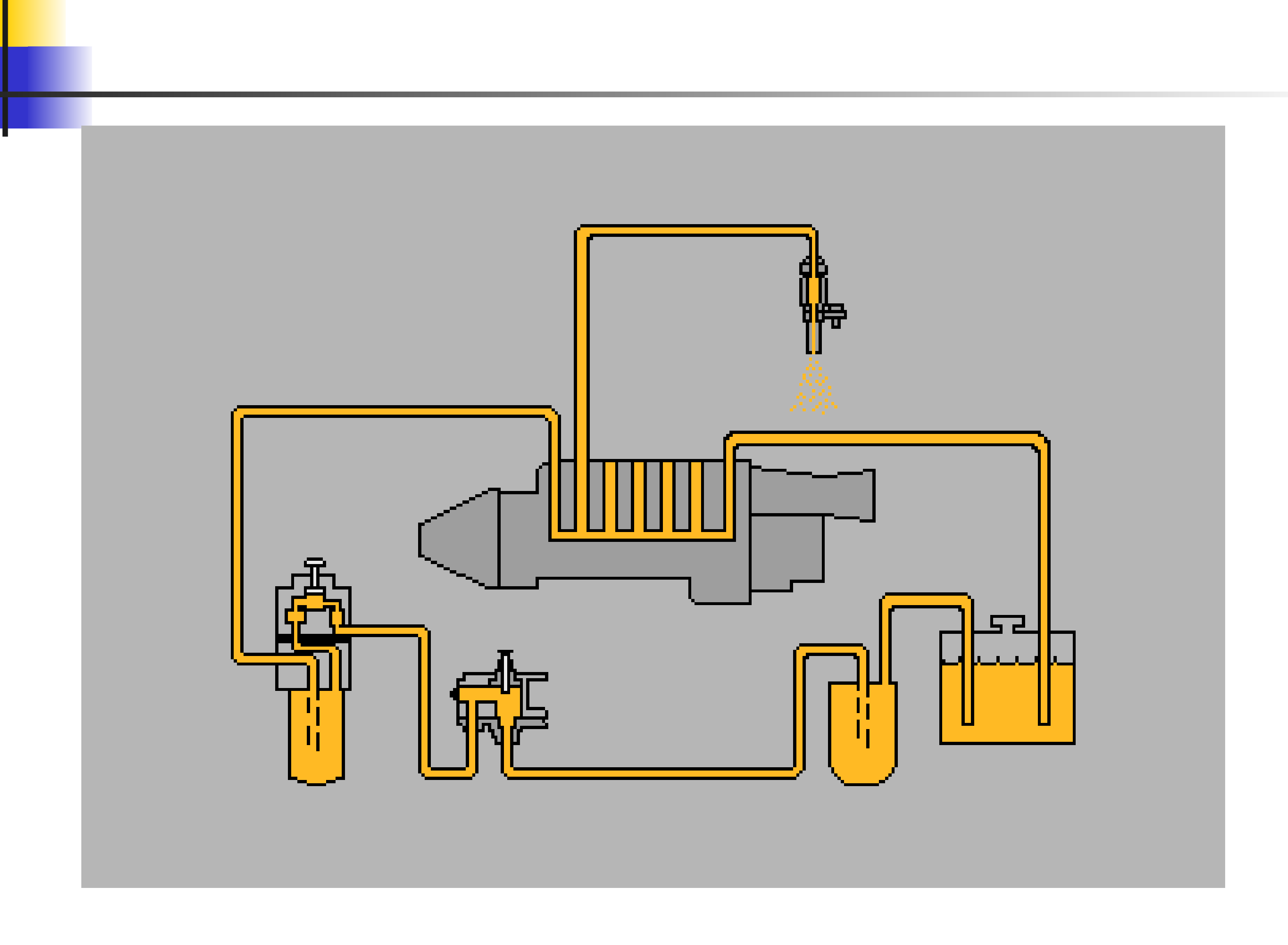
Caterpillar Fuel Systems

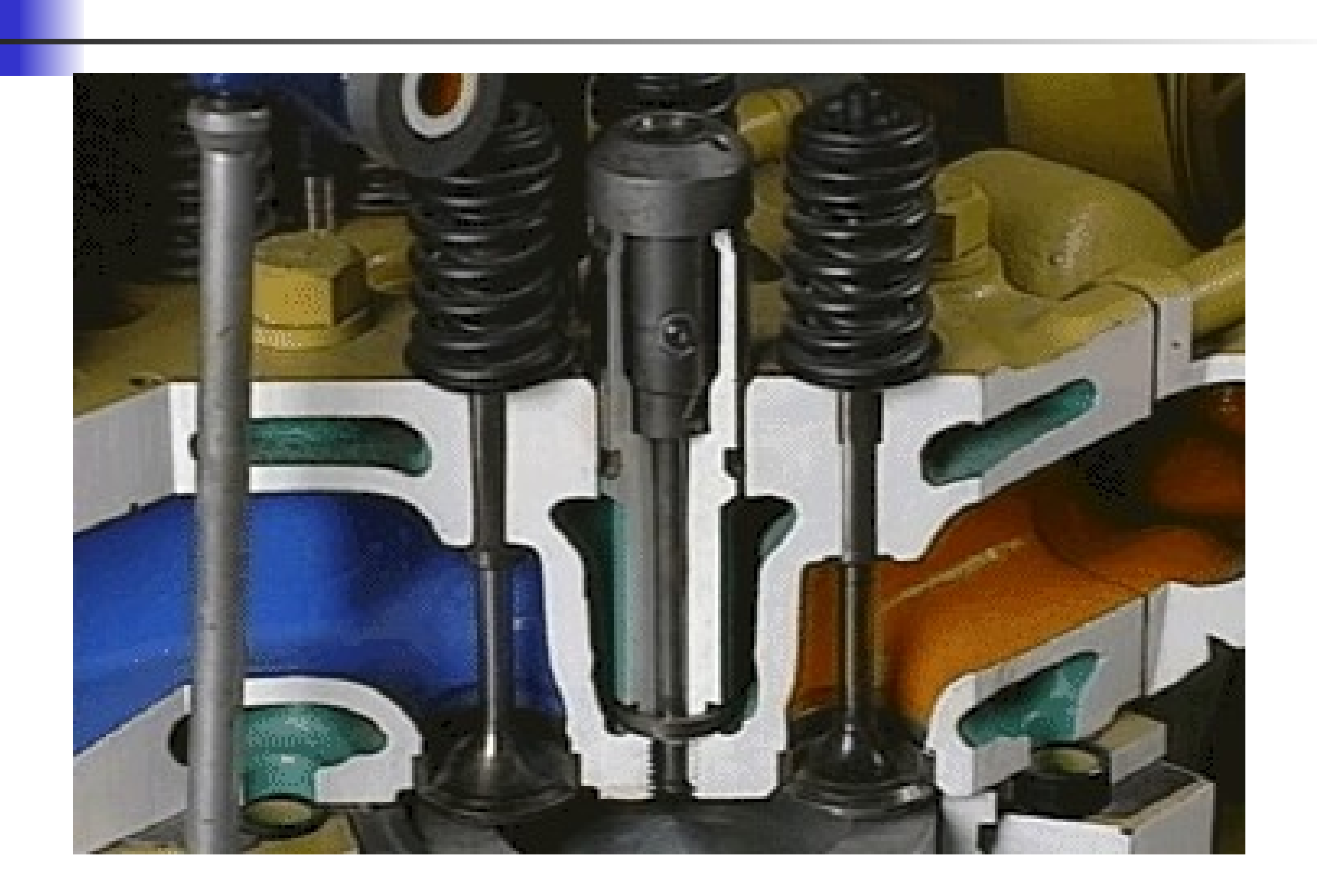
- Injection pump & high pressure lines System
- Programmable Electronic Engine Control fuel system (PEEC)
- Mechanical Unit Injector system (MUI)
- Electronic Unit Injector system (EUI)
- Hydraulically actuated Electronic Unit Injector system (HEUI)

Caterpillar Fuel Systems



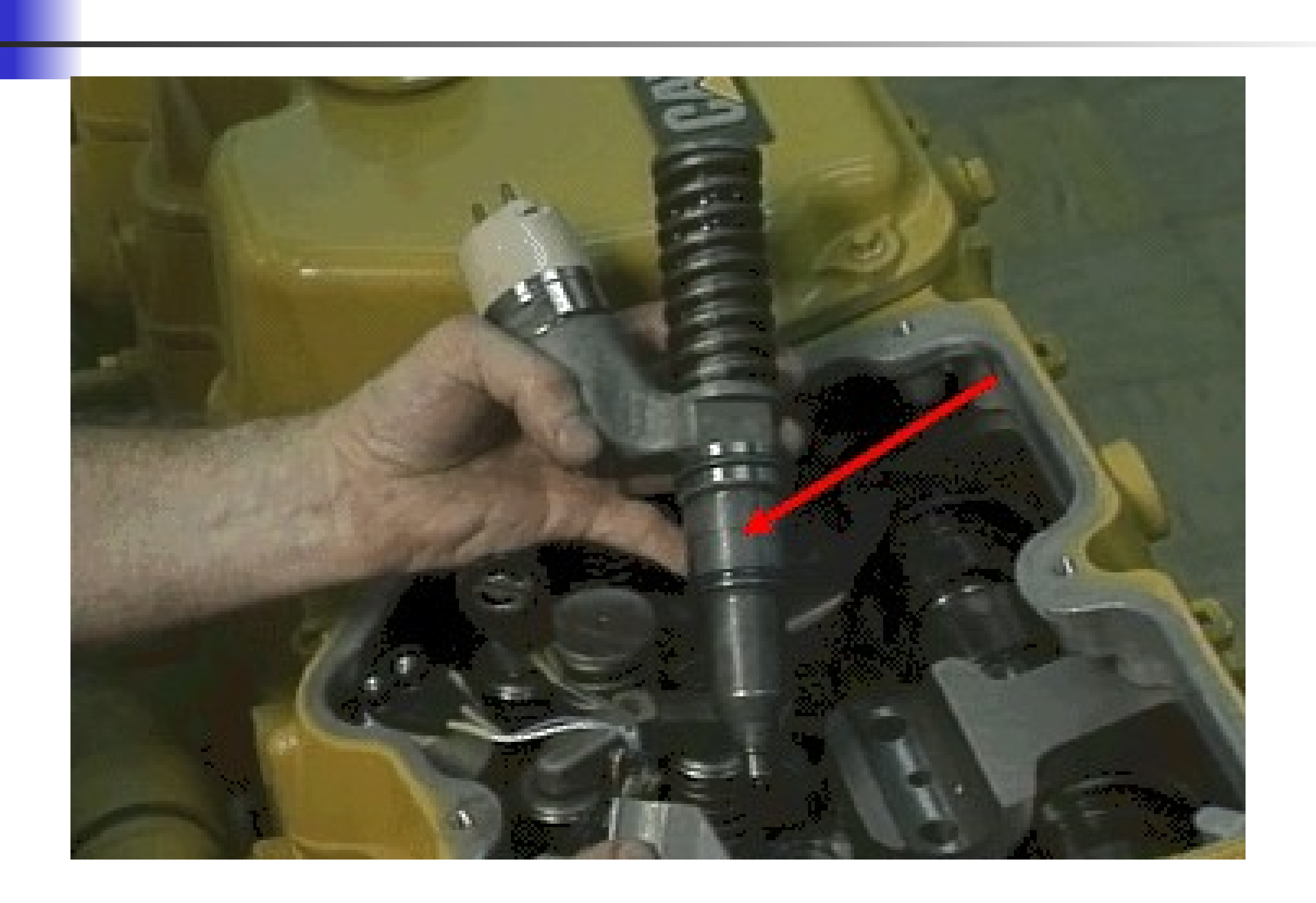




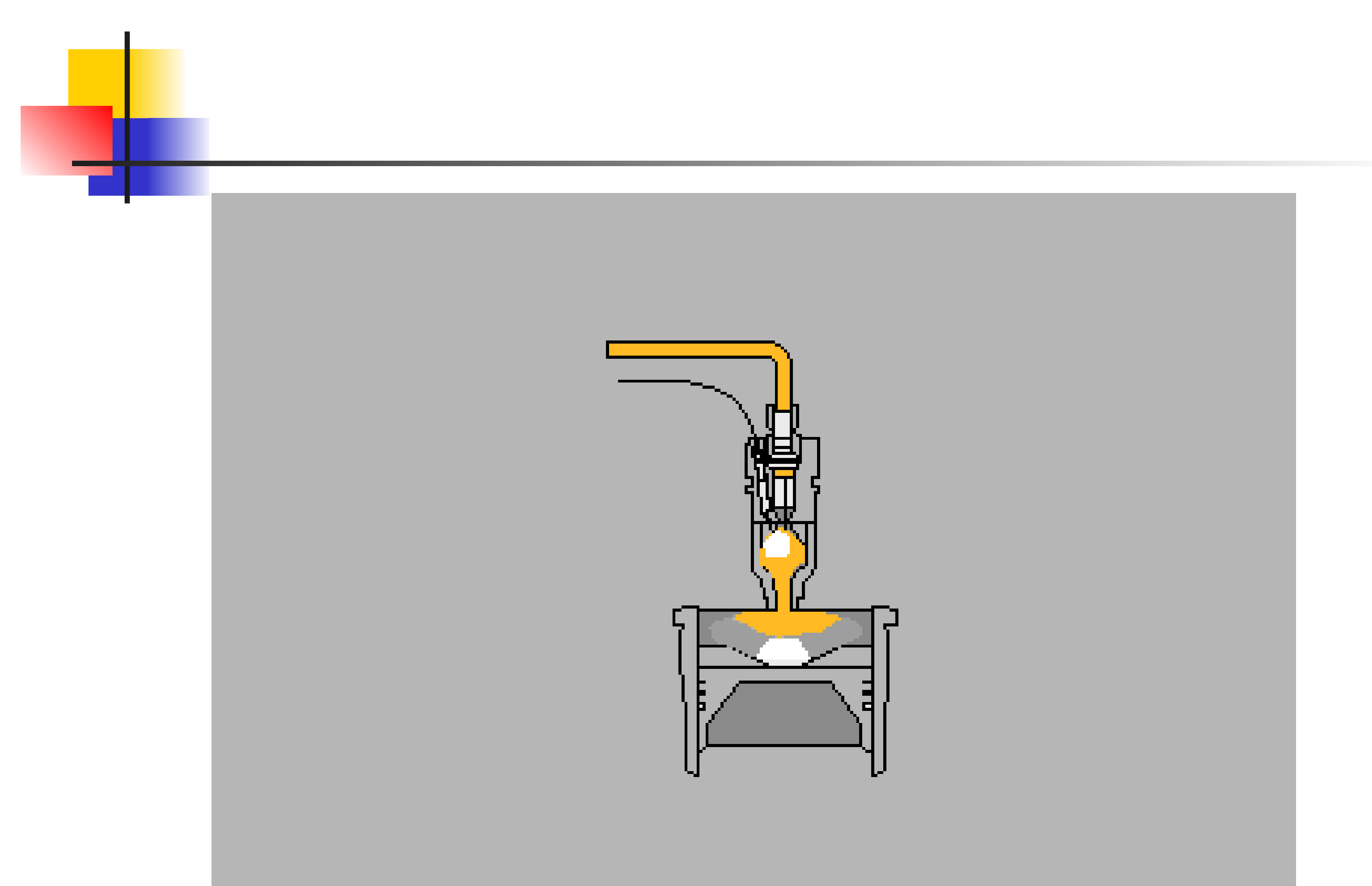






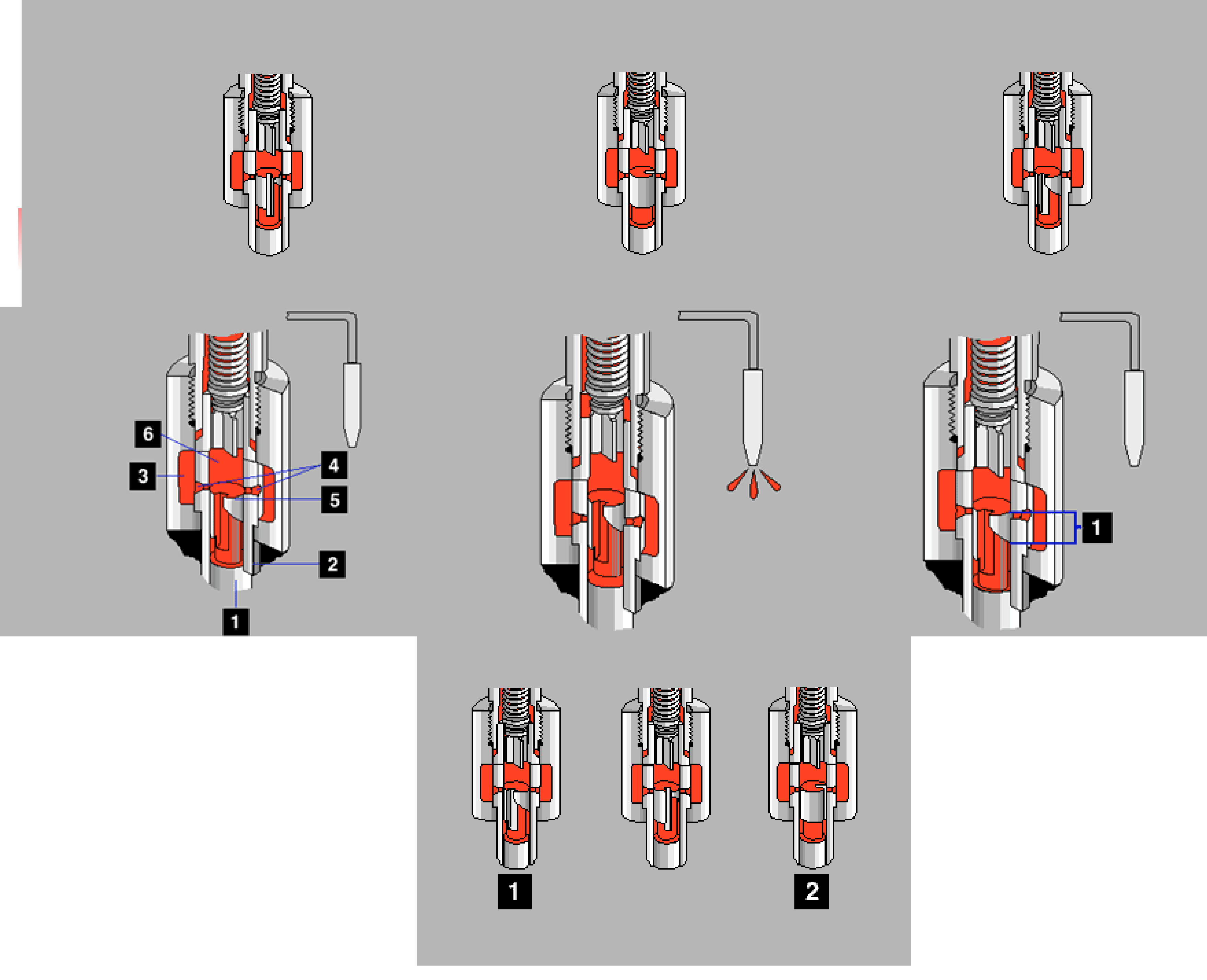


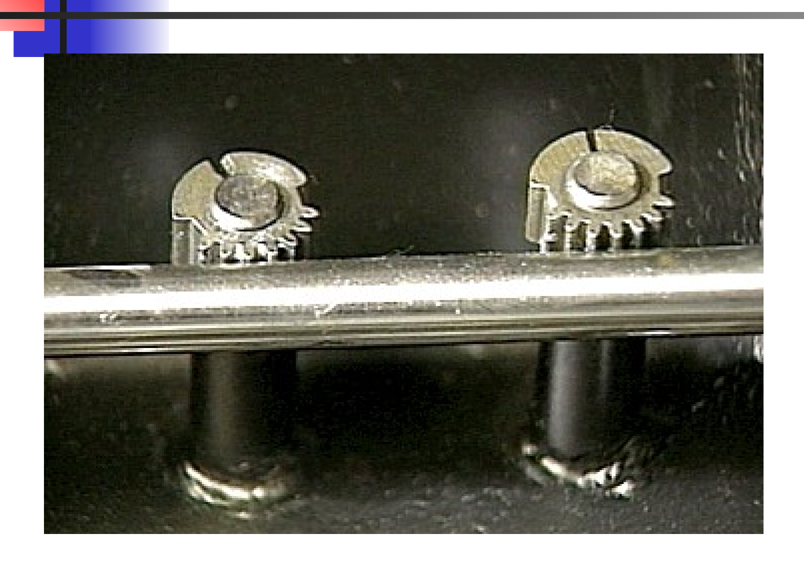


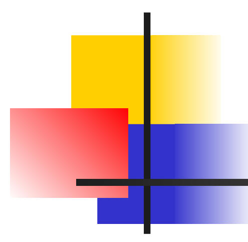


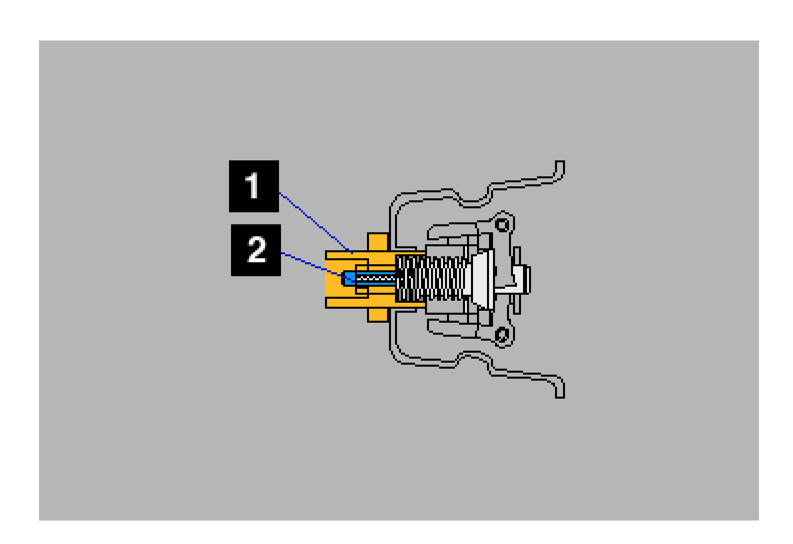


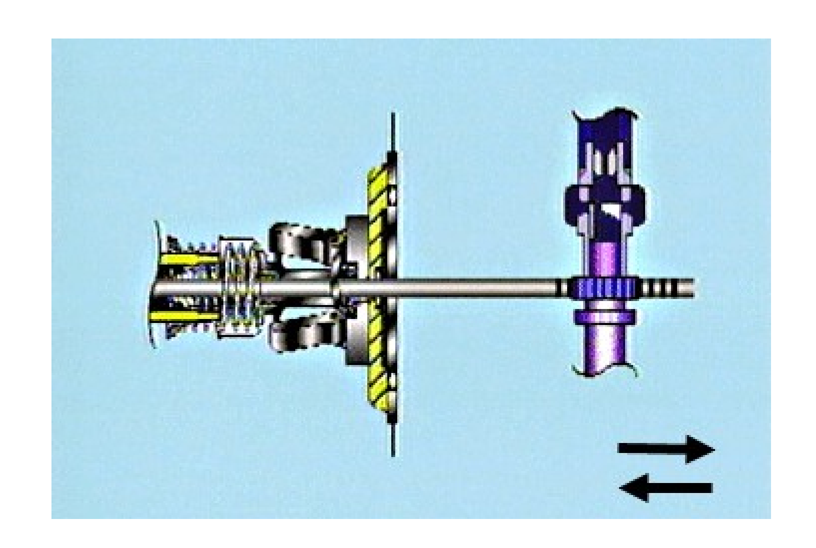


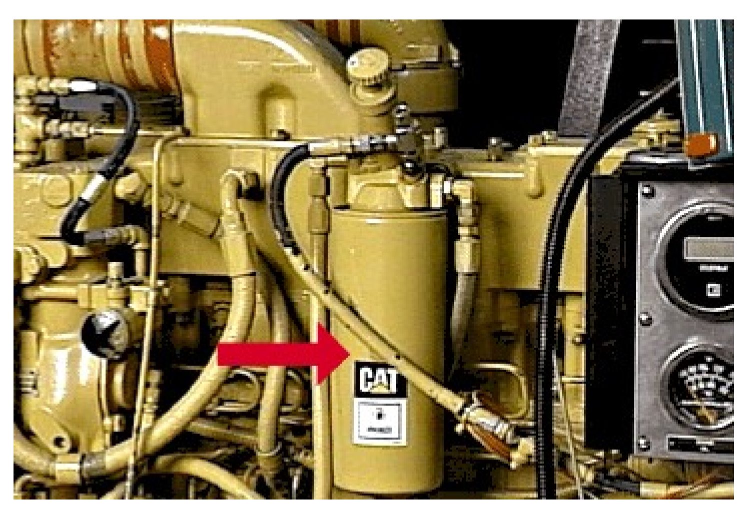

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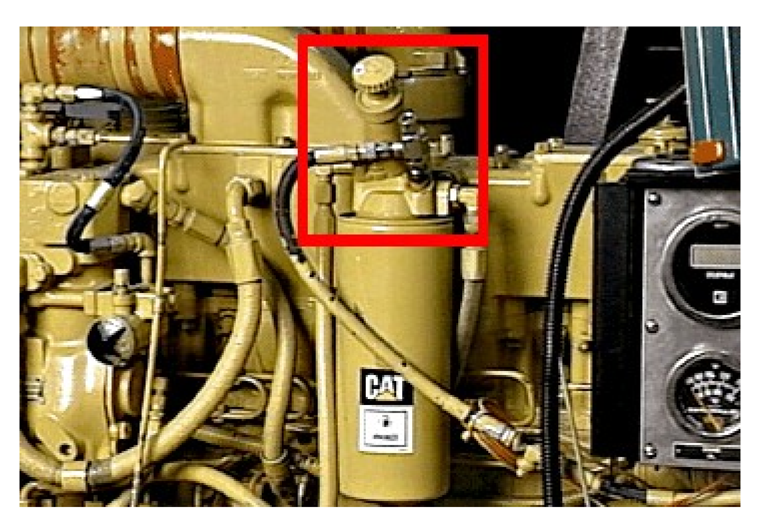


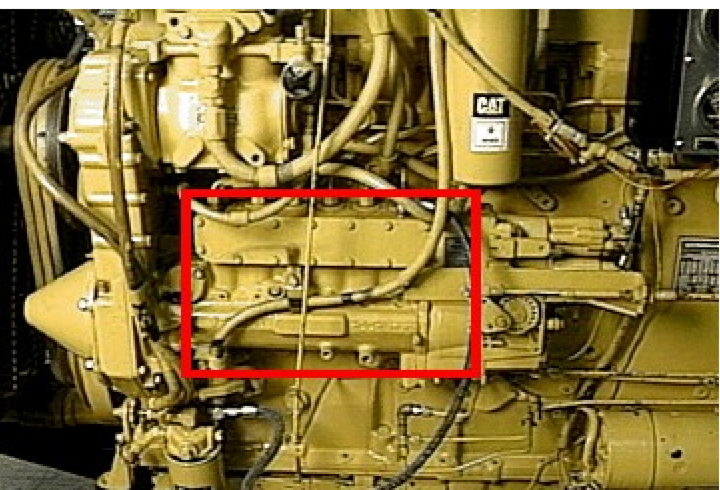


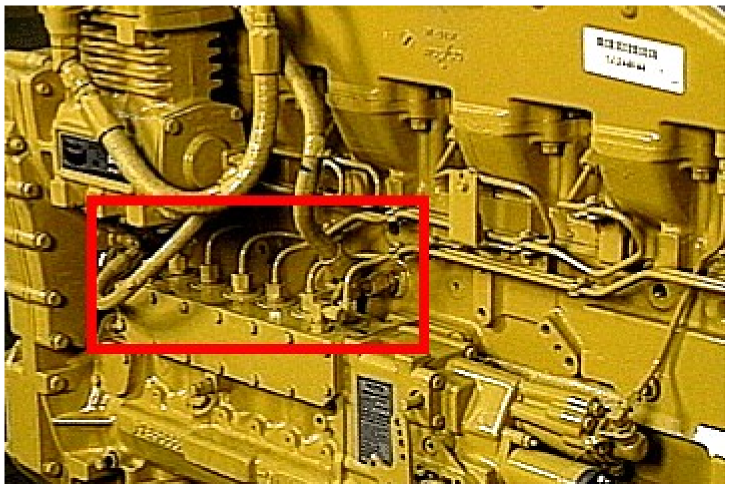

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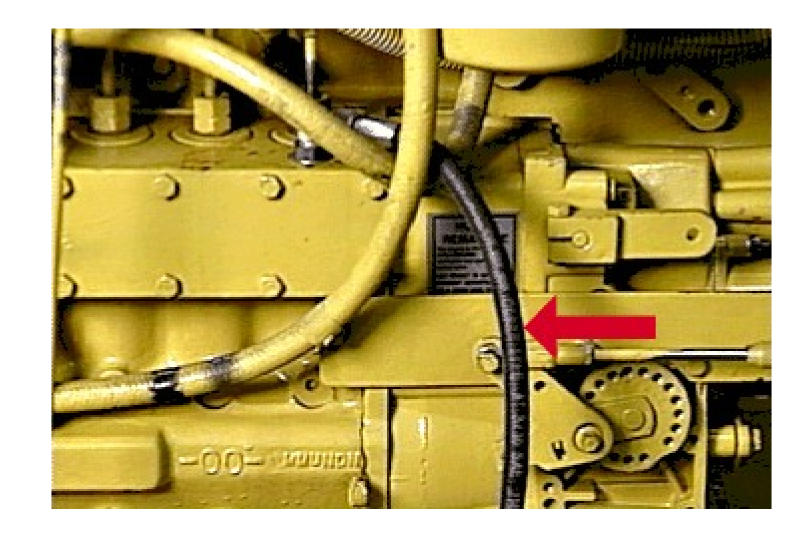

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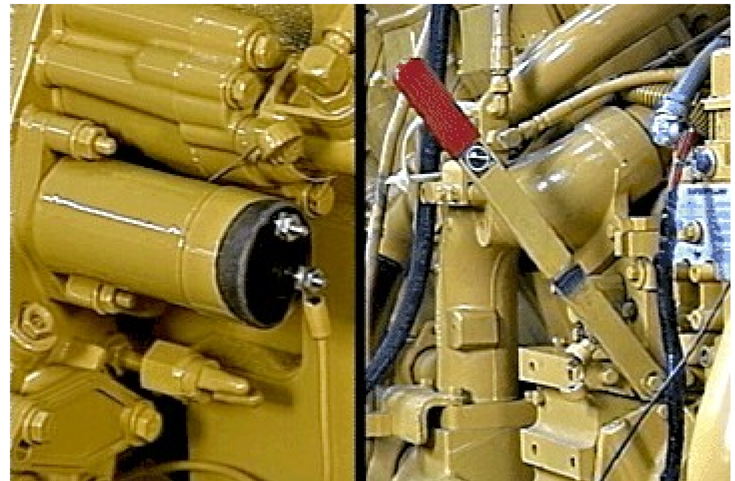

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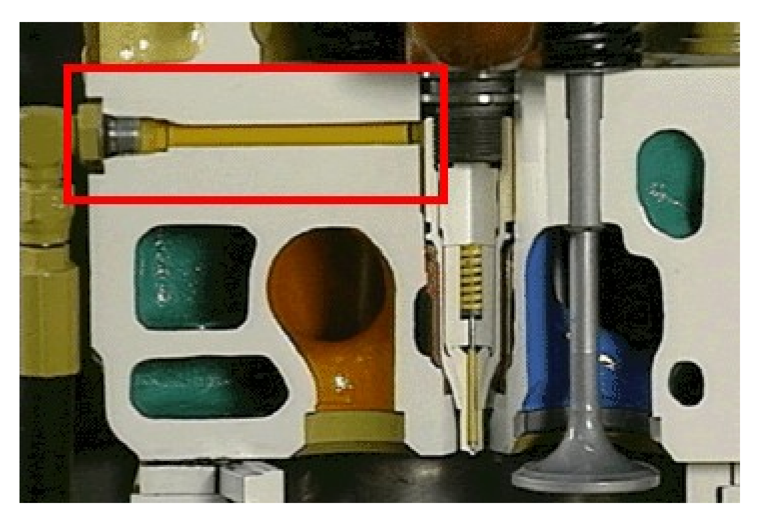

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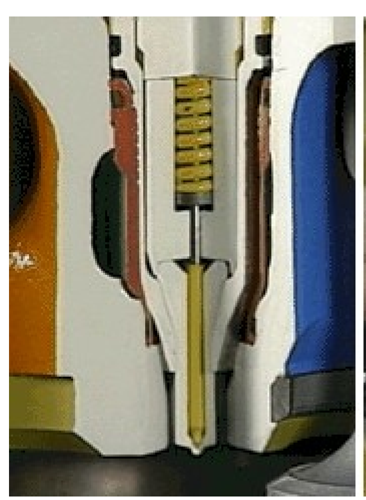




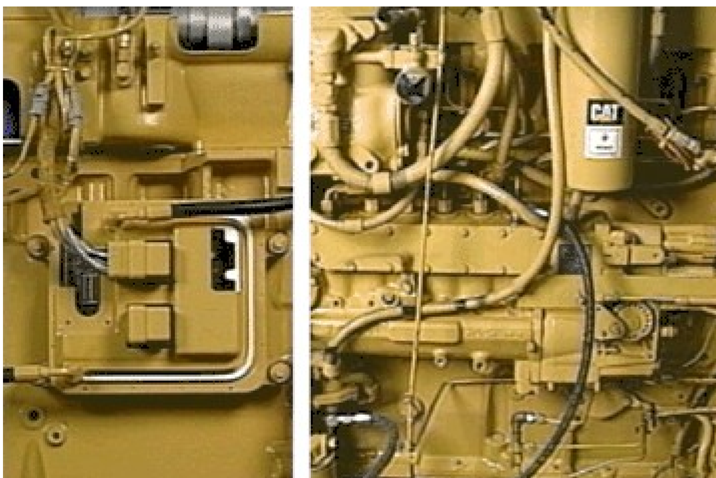


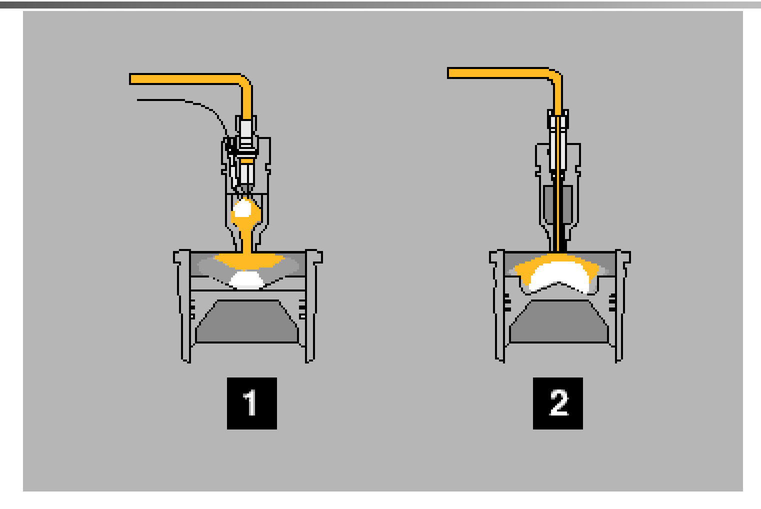









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